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IRON FROM THE OHIO MOUNDS; A REVIEW OF THE
STATEMENTS AND MISCONCEPTIONS OF TWO
WRITERS OF OVER SIXTY YEARS AGO.

BY F. W. PUTNAM.

THE interesting discovery of masses of meteoric iron, and several ornaments made of it, among the objects obtained from two altar mounds in the Little Miami valley during the past year, caused me to review the statements which have been made in relation to the discovery of iron in the Ohio mounds. It has been generally accepted as facts that an iron or steel sword was found by Dr. Hildreth in a mound at Marietta, and that an iron blade and a plate of cast iron were found by Mr. Atwater in a mound at Circleville, and these supposed facts have been used in four different ways:

First, as showing that the people who built the mounds had acquired the knowledge of manufacturing implements from iron, and hence were far in advance of the Indian tribes who afterwards occupied the country; or

Secondly, that the ancient mound-builders had occasional intercourse with nations farther advanced in the arts than themselves.

Thirdly, as proving beyond question the recent origin of the mounds: since the iron or steel weapons must have been obtained from the whites, and therefore the mounds were erected after contact of the Indians with the Europeans; or

Fourthly, that, while the mounds themselves were very ancient, the iron was introduced in recent times in connection with intrusive burials.

If we examine the original statements from which these deductions have been drawn, we shall find the premises do not warrant any of these conclusions, from the fact that the evidence does not show that either steel, or wrought or cast iron were found.

While the belief in the great antiquity of the Ohio mounds is not disturbed by these former misconceptions, it is not necessary for us to assume that they were made by a people differing in blood from some of the more recent tribes of the Short-headed American Mongoloids, some of whom may still exist in more or less purity among the present Indians; nor are we at all brought in conflict with the unquestionable

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fact that some of the Indian tribes down to very recent times erected mounds over their dead.¹

The reference to iron in the mound at Circleville, by Mr. Atwater,² would not be worthy of consideration, were it not for the widespread belief that he found a steel sword and a piece of cast iron. He simply found a piece of antler, in one end of which a hole had been bored and around this part was a band of silver. This he called "the handle of either a small sword or a large knife," and he distinctly states that "no iron was found, but an oxyde remained of similar shape and size." This is evidently purely a case of imagination and misconception. Similar pieces cut from antler have since proved to be common and are generally believed to be handles³ for small drills and knives made of stone or copper. "The oxyde of similar shape and size" to the blade of a sword or a knife, could be readily accounted for by one familiar with the traces of oxidized copper, iron-colored clay, and traces of oxide of iron, which are often met with in mound explorations.

The other reference, on the same page, is as follows:—"A plate of iron, which had become an oxyde; but before it was disturbed by the spade, resembled a plate of cast iron." In these days when only the most careful and critical work is of any value, something more definite than this statement is required before it can be claimed that cast iron has been found in the Ohio mounds.⁴

Fortunately, most of the interesting objects found in June, 1819, in a mound at Marietta, Ohio, by Dr. S. P. Hildreth, were presented to the Antiquarian Society by Dr. Hildreth, and, through the kindness of the officers of the Society, I have had recently the opportunity of studying them. As these specimens have become of the first importance in American Archaeology, and as they were not correctly figured in the original account,⁵ I have thought it of sufficient importance to refer to them in detail and to figure them in this connection.

The account of these interesting specimens was written by Dr. S. P. Hildreth, and published in a Marietta paper of July, 1819. This was

¹ See 16th Report of Peabody Museum for an account of the burial of Big Elk, an Omaha chief, as one instance.

² *Archæologia Americana*, Vol. I., p. 178. 1820.

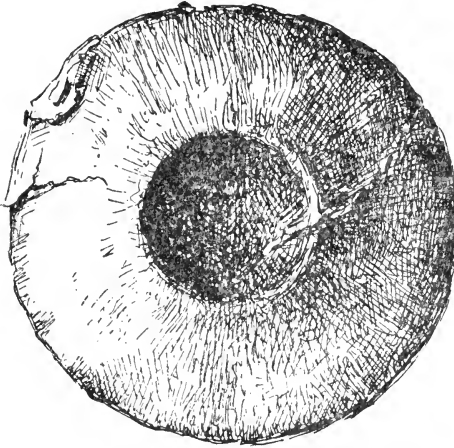
³ One has been found with a small stone knife still in the perforated end, and others with small awl-like points of copper inserted.

⁴ Mr. Atwater states that the mound in which these objects were found was removed several years before his account was written, and we do not know how much of the published statement was given from memory.

⁵ The three figures given by Squier in his account of the articles, in the appendix to his "*Aboriginal Monuments of New York*," p. 187 (1849), *Smith. Contrib.*, Vol. II., are also very inaccurate representations of the silver objects.

reprinted in Mr. Atwater's "Description of the Antiquities discovered in the State of Ohio and other Western States."¹

FIG. 1.



Outer silver-covered surface of Ear-ornament from the Marietta Mound.

color of the earth, it would seem that the funeral obsequies had been celebrated by fire; and while the ashes were yet hot and smoking, a circle of thin flat stones had been laid around and over the body. The circular covering is about eight feet in diameter. * * * * This circle of stones seems to have been the nucleus on which the mound was formed, as immediately over them is heaped the common earth of the adjacent plain, composed of a clayey sand and coarse gravel. This mound must

The mound in which these objects were found was in one of the "streets of Marietta, on the margin of the plain, near the fortification. * * * *

They appear to have been buried with the body of the person to whose memory this mound was erected. * * * * The body of the person here buried, was laid on the surface of the earth, with his face upwards. * * * * *

From the appearance of several pieces of charcoal, and bits of partially burnt fossil coal, and the black

FIG. 2.



Inner surface of fig. 1. *a*, edge of silver turned over from outer surface. *b*, circular plate of copper upon which silver is laid. *c*, inner plate of copper. *d*, fibre around central axis.

¹ *Archæologia Americana*, Vol. I., p. 168. 1820.

originally have been about ten feet high, and thirty feet in diameter at its base. * * * * * It has every appearance of being as old as any in the neighborhood, and was, at the first settlement of Marietta covered with large trees * * * * *."

"Lying immediately over, or on the forehead of the body, were found three large circular bosses, or ornaments for a sword belt, or a buckler: they are composed of copper, overlaid with a thick plate of silver. [See fig. 1.] * * * * * Two of these are yet entire; the third one is so much wasted that it dropped in pieces on removing it from the earth. Around the rivet of one of them [See fig 2.] is a small quantity of flax or hemp, in a tolerable state of preservation."

FIG. 3.



Inner surface of portion of copper-plate, once part of an Ear-ornament, from the Marietta Mound.

been found in other mounds and have been described by several authors, but their character has heretofore not been determined.

In the chapter on antiquities, p. 205, of Drake's *Picture of Cincinnati*, published in 1815, there is an account of the contents of a mound which formerly stood at the intersection of Third and Main streets in Cincinnati. A portion of the many interesting objects taken from this mound were described and figured in the fourth volume of the *Transactions of the American Philosophical Society* (1799), by Col. Winthrop

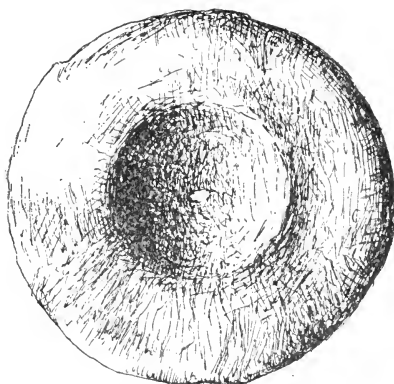
One of these silver plated "bosses," figs. 1, 2, and also portions of another, without the silver plating, probably of the one described as "so much wasted that it dropped in pieces," figs. 3, 4, are in the Society's cabinet and are here represented of full size. They are of the same character as the copper ornaments from a mound in Tennessee, and described in the Fifteenth Report of the Peabody Museum, p. 109. The illustrations there given are here reproduced for comparison, figs. 5, 6, 7, natural size. Similar articles have

FIG. 4.



Fragments of the inner plate of copper attached to central part of plate represented by fig. 3.

FIG. 5.



Outer surface of upper half of a Copper Ear-ornament. From Mound in Franklin, Tenn.

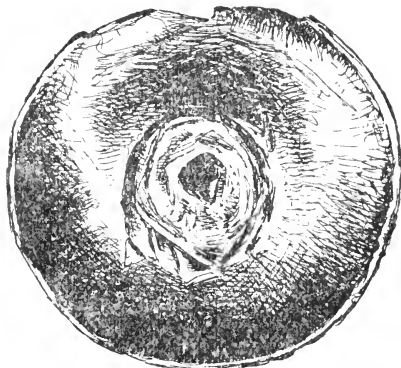
that "they all appear to consist of pure copper, covered with a green carbonate of that metal." So far as I am aware, this is the first account of objects of this character, and Dr. Hildreth's, four years afterwards, is the second.

Of late years the name of "spool-shaped objects" has been given to these copper ornaments, and at the time I wrote the description of those from Tennessee I retained the name for them, while stating that if they had come from Mexico or Peru I should have little hesitation in regarding them as ear-ornaments. At that time I had never seen any representation, in pottery or stone, of a human figure from the mounds or graves in the United States, with stud-like ear ornaments, similar to those so commonly represented in the pottery figures of men from Mexico and Peru. In the many human figures from the United States, in the Peabody Museum, on the contrary, the ears were represented as pierced by small holes as if for the suspension of earrings.

The important discoveries made during the last year in mounds in Ohio by Dr. C. L. Metz and myself have brought to light a large number of these interesting copper ornaments, some of which are covered, or

Sargent of Cincinnati, under date of September 8, 1794. Mr. Drake, after referring to these objects, states that he afterwards found a number of other things in the same mound, which he describes, and among them "Several copper articles, each consisting of two sets of circular concavo-convex plates; the interior one of each set connected with the other by a hollow axis, around which had been wound a quantity of lint" (p. 207). He also states that several other articles resembling these have been found in other parts of the town, and

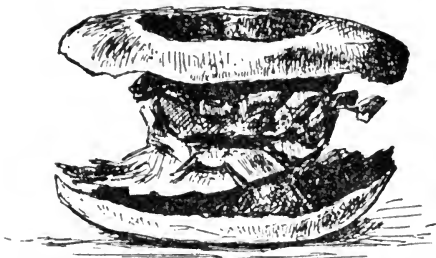
FIG. 6.



Inner surface of lower half of a Copper Ear-ornament (fig. 5 represents the other half), showing the fibre wound around the central portion. From Mound in Franklin, Tenn.

plated, with thin layers of silver, like those found by Dr. Hildreth, while at least one is overlaid in the same manner with a thin sheet of meteoric iron. During these explorations there were found a number of terra-cotta figurines of a character unlike anything heretofore known

FIG. 7.



A second Copper Ear-ornament, showing fibre and strip of buckskin wound and tied about the central portion. From Mound in Franklin, Tenn.

from the mounds, and one of these, representing in miniature a full length figure of a man, leaves little doubt that these "spool-shaped objects" and "bosses" are ear-ornaments. In this instance the ornament is distinctly shown as two large discs with the lobe of the ear between them. About thirty of these copper, and silver and iron-

plated ear-ornaments were found on one altar in a mound in the Little Miami Valley, and in another mound of the same group three pairs were discovered with human skeletons, and in each case one was found on the right side and one on the left, near the skull.

The fact that vegetable fibre and strips of buck-skin (preserved by the action of the copper) have been found in several of these ornaments wound round the central axis, or that part of the ornament which would come in direct contact with the flesh of the ear, is also of importance in the conclusion that they are ear-ornaments, as the ear was thus protected from the copper.

Dr. Hildreth mentions that "Two small pieces of leather were found lying between the plates of one of the bosses; they resemble the skin of an old mummy, and seem to have been preserved by the salts of the copper." Fragments of these bits of leather or skin are still with the specimens, and are represented in fig. 8; they

are very much changed in structure and impregnated with green carbonate of copper. Without a very thorough histological study, it would be impossible to state with certainty that these bits of skin are or are not fragments of the ear-lobe in which the ornament was inserted, but in external appearance and microscopical structure they very closely resemble the skin from the ear of a Peruvian mummy.

In referring to the silver covering on the "bosses" found by Dr. Hil-

FIG. 8.



Supposed to be portions of a human ear. From one of the Copper Ear-ornaments found in the Marietta Mound.

dreth, Mr. Squier writes "These articles have been critically examined, and it is beyond doubt that the copper "bosses" are absolutely plated, not simply overlaid, with silver. Between the copper and the silver exists a connection such as, it seems to me, could only be produced by heat; and if it is admitted that these are genuine remains of the Mound-builders, it must at the same time be admitted that they possessed the difficult art of plating one metal upon another. There is but one alternative, viz: that they had occasional or constant intercourse with a people advanced in the arts, from whom these articles were obtained."

In all this I must differ from the distinguished writer to whom American archæologists are more indebted than to any other one person. A careful study of the Hildreth specimens, and also of the silver and iron-covered specimens in the Peabody Museum, has shown conclusively that the plating has been done simply by covering the outer surfaces of the objects with thin sheets of the overlaid metal, which were closely united to the copper simply by pounding and rubbing, and by turning the edges over and under the slightly concave edge of the copper foundation. This method was followed in all the objects from the mounds and stone-graves, where thin layers of native copper, silver, or iron, have been connected with one another, or when copper or silver have been used to cover beads and discs made of wood.

These ear ornaments exhibit a degree of skill in working the native metals of copper, silver and iron, simply by hammering, which is conclusive evidence of the advance made by early American tribes in ornamental art. The method of their manufacture seems to have been somewhat as follows: A circular piece of native copper¹ was formed

FIG. 9.

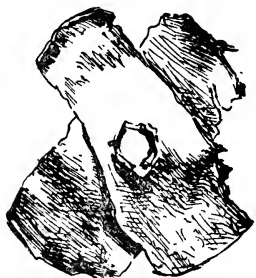


Fig. 9. Inner strengthening pieces of Copper.

FIG. 10.



Portions of Copper Ear-ornaments from an altar in a Mound in the Little Miami Valley, Ohio.

Fig. 10. Inner parts showing the central hollow rivet at a.

by hammering, probably over a wooden pattern, into the concavo-convex form shown in the several figures. Two such circular pieces

¹ Among the important material, already referred to, from an altar in a mound in the Little Miami Valley, explored for the Peabody Museum during the past season, were two halves of these ornaments made of meteoric, or native, iron, instead of copper as in all other specimens of which we have knowledge.

formed the two outer portions of the ornament. To the inner side of these, either roughly shaped circular pieces or cross bars, fig. 9, were closely fitted by hammering, and over these, in some instances, another circular piece was fitted. Through all these pieces a central hole was punched, through this a cylinder of copper was passed, the ends of which were expanded and closely hammered down, firmly uniting the two principal concavo-convex pieces together. In some specimens this hollow rivet was clinched so as to unite all the inner pieces together, as shown in fig. 10, and through it was passed another and more delicate cylinder which held the two outer pieces in place. The outer pieces were then most carefully hammered and rubbed until the expanded edges of the central rivet were so closely united to them as hardly to be traced, or, as is more often the case in the more than thirty specimens I have examined, the two outer pieces were carefully overlaid by thin sheets of native copper, silver, or iron, forming a plating like the one covered with silver, obtained by Dr. Hildreth, and now in the collection of this Society. Around the central axis vegetable fibre, bits of buckskin, or other material, was probably wound to protect the ear from contact with the copper. As already stated, such wrappings have been preserved on several of the specimens. In the drawing representing the silver-covered specimen from the Marietta mound, the several parts are indicated by letters.

To insert one of these ornaments, a slit, equal in length to the diameter of the ornament, would have to be made in the lobe of the ear, but when we recall the immense size of the slits made in the ears by some Indians, those necessary for the insertion of these ornaments become very slight in comparison.

Dr. Hildreth, in his account of the objects from the Marietta mound, writes about the next to receive attention as follows: — "Near the side of the body was found a plate of silver, which appears to have been the upper part of a sword scabbard; it is six inches in length and two in breadth, and weighs one ounce; it has no ornaments or figures, but has three longitudinal ridges,¹ which probably correspond with edges, or ridges, of the sword. It seems to have been fastened to the scabbard by three or four rivets, the holes of which yet remain in the silver."

Figures 11, 12, represent, of full size, the two sides of this supposed "ornament of a scabbard." As stated by Dr. Hildreth, it is made of pure silver. It was formed by hammering a mass of native silver into a thin sheet about five and a quarter inches long by four in width, which was then folded over so that the two ragged edges met along the centre of the under or flattened side, making a band which would cover an object about half an inch thick and one and three-quarters in width. Along these ragged edges six small holes have been punched. The

¹ It is strange that the discrepancy between this account and the figures given in the *Archæologia*, and also by Squier, which represent the band with five ridges, has not been noticed.

FIG. 11.



FIG. 12.



Silver Band or Ornament. From the Marietta Mound. Fig. 11, under, flat surface; fig. 12, upper, corrugated portion.

four near the ends are nearly opposite to each other, while the two near the central portion are placed one slightly above the other. These holes were probably intended for the purpose of fastening the edges together by strings, or else for securely fixing the band to some other

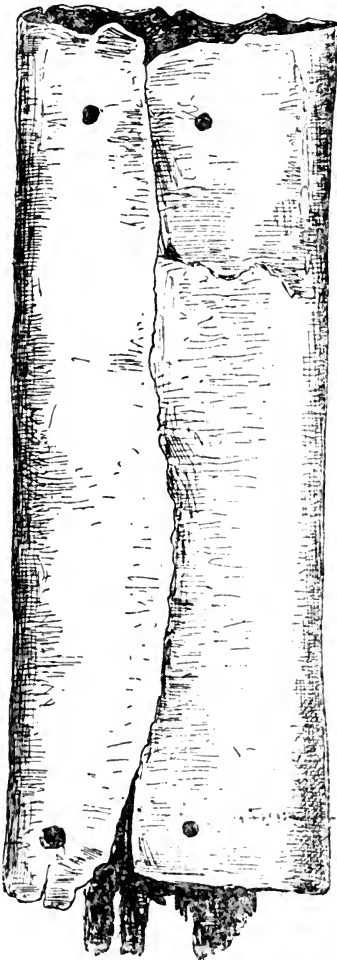
object. On the opposite surface are the three longitudinal elevations,

FIG. 13.



Section of Copper Band from Mound in Franklin, Tenn. This section is taken at *a*, fig. 15.

FIG. 14.



with two deep corresponding depressions between them, which could have been easily made by using a round stick (See fig. 13.) The smooth cut made at upper corner on the under side, is evidently where a piece of the metal has been cut off for examination since it was found.

FIG. 15.



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Opposite surfaces of Copper Band. From Mound in Franklin, Tenn.

In the Fifteenth Report of the Peabody Museum, p. 106, I have given a description of an ornament almost identical with this in shape and size, but which was made of native copper. It was found in the same mound in Tennessee with the two ear-ornaments already referred to. For the purpose of showing the similarity of the silver and copper bands the figures of the Tennessee specimen are here reproduced as figures 14, 15.

In the account of the specimens obtained from the mound in Cincinnati explored in 1794, to which I have already referred in connection with the ear-ornaments, Col. Sargent describes and figures¹ a similar corrugated band made of copper, which is nearly identical in size with the one of silver obtained by Dr. Hildreth.

Col. Sargent's description of this copper band is as follows:—"Fig. 10. A piece of sheet or plate copper, which seems to have been wrought into an ornament for the hair; this, however, only conjecture: No. 1 shows the back and folding parts with four perforations. No. 2 is intended to give an idea of the other side, which is swelled longitudinally into three pipes or divisions. The remains of some smaller pipes enclosed and now almost mouldered away, seem to destroy the idea of its being originally meant as a mere hair ornament."

The "smaller pipes enclosed and almost wasted away" were very likely portions of the inner layers of the copper separated by oxidation of the metal. The figure given in the Philosophical Transactions probably represents the object more as the discoverer supposed it appeared when perfect, as the edges and surface are altogether too even and smooth for a piece of copper containing other pieces which had "almost wasted away." The suggestion that the ornament was one for the hair is worthy of consideration, as in one of the terra-cotta figurines from the altar of a mound in the Little Miami valley, to which I have already referred, the hair is represented as done up in three parallel plates crossing the back of the head, just as it would appear were the hair passed through such a corrugated band as here described. In the specimen from a mound in Tennessee there were the remains of pieces of wood from which fact I was led to believe that the copper band may have been fastened to wood and attached as an ornament to a belt or some other part of the dress of its owner.

To these three specimens I have now the opportunity of adding a fourth. This is made of meteoric iron, and was found in the mass of materials from the altar of a mound in the Little Miami Valley to which allusion has several times been made. It is represented of full size in fig. 16, and was made by hammering a mass of meteoric iron, in the

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¹Transactions of the American Philosophical Society, Vol. IV., p. 180, figs. 10¹, 10². 1799.

same way that masses of silver and copper were hammered in making the three already mentioned.¹

FIG. 16.



Corrugated Band made of Meteoric Iron.
From Altar in Mound, Little Miami
Valley, Ohio.

It is worthy of note that all four of these corrugated bands of identical pattern were found associated with stud-like ear-ornaments.

The next object from the Marietta mound is mentioned by Dr. Hildreth as follows:—
“Two or three broken pieces of a copper tube were also found, filled with iron rust. These pieces, from their appearance, composed the lower end of the scabbard, near the point of the sword. No sign of the sword itself was discovered, except the appearance of rust above mentioned.”

These pieces of “a copper tube” are represented of full size in fig. 17, and consist of fragments of a small copper cylinder, or bead, such as have been very often found in the mounds and in graves in various parts of the country. In my article on copper objects in the Peabody Museum,² several lots of similar cylindrical copper beads are described and figured. In every case they were made by simply rolling a thin piece of hammered native copper upon itself, and the one from the Marietta mound is no exception to this method of manufacture. In this specimen the copper has changed to a red carbonate, and has become very brittle from oxidation. In places, particularly in the fragment shown on the right of the figure, the surface is covered by a green carbonate of copper and here and there bits of charcoal and other extraneous materials have been

¹ A full account of the interesting group of mounds in the Little Miami Valley, with descriptions and illustrations of the many objects found, will be given in the memoir prepared jointly by Dr. C. L. Metz and myself and to be published by the Peabody Museum.

² Fifteenth Report, Cambridge, 1882.

united to the copper during its change to the carbonate. The central portion of the cylinder has been crushed together and the portion on the left of the figure has been broken lengthwise into two pieces.

FIG. 17.



Broken Bead or Cylinder of Copper. From the Marietta Mound.

Not a particle of iron rust could be found in the folds and cavities of the bead, and it can hardly be doubted that the oxide of copper was mistaken by Dr. Hildreth for oxide of iron.

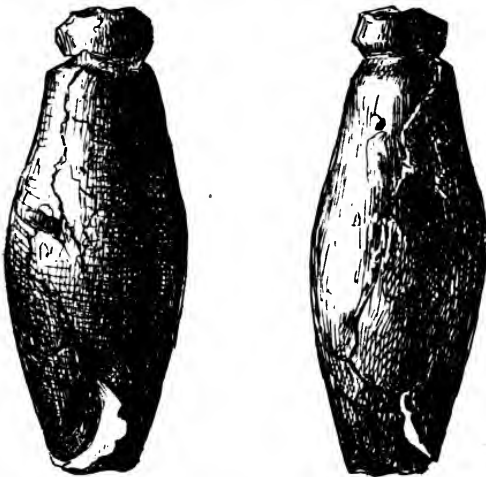
In this instance we see how easily it is to let our imagination run away with our facts. Not a shadow of a sword can be traced in this connection; the point of the supposed scabbard is a common copper bead; the supposed upper part of the scabbard is an ornament of a particular pattern, of which three others almost identical in shape are known from other mounds; and the "bosses" or supposed ornaments of a sword belt are ear-rings. Yet for over sixty years archæologists have had the mythical swords from the Marietta and Circleville mounds held over them as proofs that all the mounds were of recent date, and that these in particular were erected after contact of the Indians with the whites.

Dr. Hildreth's account continues "Near the feet was found a piece of copper, weighing three ounces. From its shape it appears to have been used as a plumb, or for an ornament, as near one of the ends is a circular crease, or groove, for tying a thread; it is round, two inches and a half in length, one inch in diameter at the centre, and half an inch at each end. It is composed of small pieces of native copper, pounded together; and in the cracks between the pieces, are stuck several pieces of silver; one nearly the size of a fourpenny piece, or half a dime. This copper ornament was covered with a coat of green rust, and is considerably corroded. A piece of red ochre, or paint, and a piece of iron ore which has the appearance of having been partially vitrified, or melted, were also found. The ore is about the specific gravity of pure iron."

The copper "plumb" mentioned by Dr. Hildreth and here represented as fig. 18, is a very interesting specimen, and is the only instance, so far as I know, of copper having been used in making objects of this character. Hundreds of similar form, made of different kinds of stone, and of hematite, have been found in mounds or on the surface all over the western and southern states, occasionally in New England, and have been generally classed as sinkers, although I am personally more inclined to regard many of them as having been used for other pur-

poses. It would hardly seem probable that a material of the value of copper for ornamental work and for cutting implements, would have been used for sinkers for nets or fishing lines when stones would answer equally well; and the adaptability of an article for a particular use is not always a safe guide in determining its character. Such objects as these were as well if not better fitted for use in stretching the threads over the frame of a hand loom in weaving, and we now know that the builders of the mounds were good weavers. They also could have been enclosed in skins and used as slung-shots, or many of the smaller sizes. like this one of copper, could well be classed as personal ornaments.

FIG. 18.



Copper Ornament or Implement from the Marietta Mound. The white portions at lower end represent the silver as seen from opposite sides.

the copper, as supposed by Dr. Hildreth, but is in its natural position in the mass, and has simply been pounded and shaped with the copper.

Red ochre, mentioned in the last quotation, is often found in mounds and in graves, not only in America but in other parts of the world as well, and is the universal red paint of man in past times.

The statement that a piece of "iron ore" was found in the mound is one of great interest, now that we know from the discoveries of the past year that the peculiar and malleable qualities of meteoric iron were known to the builders of the group of mounds in the Little Miami Valley, and it is unfortunate that, while the other articles mentioned in the account are now in the cabinet of the Society, this iron ore can not now be found. Mr. Squier, in quoting Dr. Hildreth's statement, considers that the ore was a piece of polished hematite, but he does not state that he examined the specimen. He simply puts the word hematite in brackets after the words "iron ore," and the word

Whatever may have been the use of this particular specimen it is of interest as having been made by pounding together an arborescent mass (not bits as stated by Dr. Hildreth) of native copper containing native silver, and such a mass was probably derived from the copper region of Lake Superior, in which place the two metals occur thus associated in arborescent or foliated masses. The silver therefore was probably not inserted in the cracks of

polished after the quotation of the word "vitrified." As he states distinctly that he examined the silver plated "boss," he may also have seen the "iron ore," and as he was familiar with implements and ornaments made of hematite he may have examined the specimen and correctly designated its character in this way. He however puts a question mark after his insertion of the word "polished" which leads me to conclude that he had not seen the specimen. In its absence, however, it is useless to attempt to discuss its true character, although the probability is that it was hematite, which is often found in the mounds; but there is a possibility that it was a small mass of meteoric iron.

In this paper I have endeavored, in the proper spirit of scientific criticism, to call attention to the misconceptions of these early writers in relation to the interesting and important discoveries and observations which they made; not with the view of finding fault with what they wrote, but with a hope that their misconceptions, now that their statements are compared with the facts obtained in later years, and corrected in the light of recent discoveries, will no longer stand in the way of the correct interpretation of the story of the mounds, which we are now able to read with clearer eyes than in the days when nearly every fact observed was thought worthless unless it could be immediately accounted for, and the unknown became intelligible by the application of the power of the imagination.

